

UNMARKED COPY

OF CLAIMS

1-22 Cancelled

23. (Previously Presented) A method, implemented within a router of a network, for recovering from a failure, comprising:

sending, via a first route, a first set of information from an ingress module to a first egress module for forwarding by said first egress module to a destination external to said router, wherein said first set of information traverses a path which encompasses at least a portion of said first route;

detecting a failure of said first egress module;

in response to said failure of said first egress module, directing a message to said ingress module informing said ingress module of said first egress module failure;

in response to said message, selecting an alternate egress module capable of forwarding information to said destination;

sending, via a second route, a future set of information from said ingress module to said alternate egress module for forwarding to said destination, wherein said first set of information and said future set of information are both part of a flow; and

in response to said message, preventing other sets of information associated with said flow from being sent from said ingress module to said first egress module;

wherein directing said message to said ingress module comprises:

identifying said ingress module;

accessing a routing table which comprises one or more routes to said

ingress module;

obtaining a return route from said routing table, wherein said return route directs said message to said ingress module along a different path than that traversed by said first set of information; and sending said message to said ingress module via said return route; and wherein said first egress module and said alternate egress module are predetermined, wherein identifiers associated with said first egress module and said alternate egress module are stored within a flow block associated with said flow, and wherein preventing comprises:

storing an indication in said flow block that all sets of information associated with said flow are not to be sent to said first egress module.

24. Cancelled
25. (Previously Presented) A method, implemented within a router of a network, for recovering from a failure, comprising:

sending, via a first route, a first set of information from an ingress module to a first egress module for forwarding by said first egress module to a destination external to said router, wherein said first set of information traverses a path which encompasses at least a portion of said first route;

detecting a failure of said first egress module;
in response to said failure of said first egress module, directing a message to said ingress module informing said ingress module of said first egress module failure;
in response to said message, selecting an alternate egress module capable of forwarding information to said destination;

sending, via a second route, a future set of information from said ingress module to said alternate egress module for forwarding to said destination, wherein said first set of information and said future set of information are both part of a flow; and

in response to said message, causing other sets of information associated with said flow to be sent from said ingress module to said alternate egress module; wherein directing said message to said ingress module comprises:

identifying said ingress module;

accessing a routing table which comprises one or more routes to said ingress module;

obtaining a return route from said routing table, wherein said return route directs said message to said ingress module along a different path than that traversed by said first set of information; and

sending said message to said ingress module via said return route; and

wherein said first egress module and said alternate egress module are predetermined, wherein identifiers associated with said first egress module and said alternate egress module are stored within a flow block associated with said flow, and wherein causing comprises:

storing an indication in said flow block that all sets of information associated with said flow are to be sent to said alternate egress module.

26. (Previously Presented) A method, implemented within a router of a network, for recovering from a failure, comprising:

sending, via a first route, a first set of information from an ingress module to a first egress module for forwarding by said first egress module to a destination external to said router, wherein said first set of information traverses a path which encompasses at least a portion of said first route;

detecting a failure of said first egress module;

in response to said failure of said first egress module, directing a message to said ingress module informing said ingress module of said first egress module failure;

in response to said message, selecting an alternate egress module capable of forwarding information to said destination; and

sending, via a second route, a future set of information from said ingress module to said alternate egress module for forwarding to said destination;

wherein directing said message to said ingress module comprises:

identifying said ingress module;

accessing a routing table which comprises one or more routes to said ingress module;

obtaining a return route from said routing table, wherein said return route directs said message to said ingress module along a different path than that traversed by said first set of information; and

sending said message to said ingress module via said return route; and

wherein said first set of information and said future set of information are both part of a flow, wherein said first egress module and said alternate egress module are predetermined, wherein identifiers associated with said first egress module and said

alternate egress module are stored within a flow block associated with said flow, and wherein selecting said alternate egress module comprises:

accessing said flow block to access the identifier associated with said alternate egress module.

27-34 Cancelled

35. (Previously Presented) A method, implemented within a router of a network, for recovering from a failure, comprising:

sending, via a first route, a first set of information from an ingress module to a first egress module for forwarding by said first egress module to a destination external to said router, wherein said first set of information traverses a path which encompasses at least a portion of said first route;

detecting an external failure beyond said first egress module;

in response to said external failure, directing a message to said ingress module informing said ingress module of said external failure;

in response to said message, selecting an alternate egress module capable of forwarding information to said destination;

sending, via a second route, a future set of information from said ingress module to said alternate egress module for forwarding to said destination, wherein said first set of information and said future set of information are both part of a flow; and

in response to said message, preventing other sets of information associated with said flow from being sent from said ingress module to said first egress module;

wherein directing said message to said ingress module comprises:

identifying said ingress module;

accessing a routing table which comprises one or more routes to said ingress module;

obtaining a return route from said routing table, wherein said return route directs said message to said ingress module along a different path than that traversed by said first set of information; and

sending said message to said ingress module via said return route; and

wherein said first egress module and said alternate egress module are predetermined, wherein identifiers associated with said first egress module and said alternate egress module are stored within a flow block associated with said flow, and wherein preventing comprises:

storing an indication in said flow block that all sets of information associated with said flow are not to be sent to said first egress module.

36. Cancelled

37. (Previously Presented) A method, implemented within a router of a network, for recovering from a failure, comprising:

sending, via a first route, a first set of information from an ingress module to a first egress module for forwarding by said first egress module to a destination external to said router, wherein said first set of information traverses a path which encompasses at least a portion of said first route;

detecting an external failure beyond said first egress module;
in response to said external failure, directing a message to said ingress module informing said ingress module of said external failure;

in response to said message, selecting an alternate egress module capable of forwarding information to said destination;

sending, via a second route, a future set of information from said ingress module to said alternate egress module for forwarding to said destination, wherein said first set of information and said future set of information are both part of a flow; and

in response to said message, causing other sets of information associated with said flow to be sent from said ingress module to said alternate egress module;

wherein directing said message to said ingress module comprises:

identifying said ingress module;

accessing a routing table which comprises one or more routes to said ingress module;

obtaining a return route from said routing table, wherein said return route directs said message to said ingress module along a different path than that traversed by said first set of information; and

sending said message to said ingress module via said return route; and

wherein said first egress module and said alternate egress module are predetermined, wherein identifiers associated with said first egress module and said alternate egress module are stored within a flow block associated with said flow, and wherein causing comprises:

storing an indication in said flow block that all sets of information associated with said flow are to be sent to said alternate egress module.

38. (Previously Presented) A method, implemented within a router of a network, for recovering from a failure, comprising:

sending, via a first route, a first set of information from an ingress module to a first egress module for forwarding by said first egress module to a destination external to said router, wherein said first set of information traverses a path which encompasses at least a portion of said first route;

detecting an external failure beyond said first egress module;

in response to said external failure, directing a message to said ingress module informing said ingress module of said external failure;

in response to said message, selecting an alternate egress module capable of forwarding information to said destination; and

sending, via a second route, a future set of information from said ingress module to said alternate egress module for forwarding to said destination;

wherein directing said message to said ingress module comprises:

identifying said ingress module;

accessing a routing table which comprises one or more routes to said ingress module;

obtaining a return route from said routing table, wherein said return route directs said message to said ingress module along a different path

than that traversed by said first set of information; and

sending said message to said ingress module via said return route; and

wherein said first set of information and said future set of information are both part of a flow, wherein said first egress module and said alternate egress module are

predetermined, wherein identifiers associated with said first egress module and said alternate egress module are stored within a flow block associated with said flow, and wherein selecting said alternate egress module comprises:

accessing said flow block to access the identifier associated with said alternate egress module.

39-58 Cancelled

59. (Previously Presented) A router, comprising:
an ingress module;
a first egress module;
an alternate egress module; and
a forwarding mechanism for forwarding information between said ingress module, said first egress module, and said alternate egress module;

wherein said ingress module sends a first set of information to said forwarding mechanism to be forwarded to said first egress module via a first route, said first set of information intended to be forwarded by said first egress module to a destination external to said router, said first set of information traversing a path which encompasses at least a portion of said first route, said forwarding mechanism detecting a failure which precludes forwarding of said first set of information to said first egress module, and in response to said failure, said forwarding mechanism directing a message to said ingress module informing said ingress module of said failure, and based upon said message, said ingress module determining that said first egress module has failed, and in response to said message, said ingress module selecting said alternate egress module and sending a future set of information to said forwarding mechanism to be forwarded to said alternate egress

module, said future set of information intended to be forwarded by said alternate egress module to said destination;

wherein said forwarding mechanism directs said message to said ingress module by:

identifying said ingress module;

accessing a routing table which comprises one or more routes to said

ingress module;

obtaining a return route from said routing table, wherein said return route

directs said message to said ingress module along a different path

than that traversed by said first set of information; and

sending said message to said ingress module via said return route; and

wherein said first set of information and said future set of information are both part of a flow, wherein said ingress module, in response to said message, prevents other sets of information associated with said flow from being sent from said ingress module to said first egress module, wherein said first egress module and said alternate egress module are predetermined, wherein said ingress module comprises a memory, wherein identifiers associated with said first egress module and said alternate egress module are stored within a flow block associated with said flow, said flow block being stored in said memory, and wherein said ingress module prevents other sets of information associated with said flow from being sent from said ingress module to said first egress module by storing an indication in said flow block that all sets of information associated with said flow are not to be sent to said first egress module.

60. Cancelled

61. (Previously Presented) A router, comprising:

- an ingress module;
- a first egress module;
- an alternate egress module; and
- a forwarding mechanism for forwarding information between said ingress module, said first egress module, and said alternate egress module;

wherein said ingress module sends a first set of information to said forwarding mechanism to be forwarded to said first egress module via a first route, said first set of information intended to be forwarded by said first egress module to a destination external to said router, said first set of information traversing a path which encompasses at least a portion of said first route, said forwarding mechanism detecting a failure which precludes forwarding of said first set of information to said first egress module, and in response to said failure, said forwarding mechanism directing a message to said ingress module informing said ingress module of said failure, and based upon said message, said ingress module determining that said first egress module has failed, and in response to said message, said ingress module selecting said alternate egress module and sending a future set of information to said forwarding mechanism to be forwarded to said alternate egress module, said future set of information intended to be forwarded by said alternate egress module to said destination;

wherein said forwarding mechanism directs said message to said ingress module by:

- identifying said ingress module;

accessing a routing table which comprises one or more routes to said ingress module;

obtaining a return route from said routing table, wherein said return route directs said message to said ingress module along a different path than that traversed by said first set of information; and

sending said message to said ingress module via said return route; and

wherein said first set of information and said future set of information are both part of a flow, wherein said ingress module, in response to said message, causes other sets of information associated with said flow to be sent from said ingress module to said alternate egress module via said forwarding mechanism, wherein said first egress module and said alternate egress module are predetermined, wherein said ingress module comprises a memory, wherein identifiers associated with said first egress module and said alternate egress module are stored within a flow block associated with said flow, said flow block being stored in said memory, and wherein said ingress module causes other sets of information associated with said flow to be sent from said ingress module to said alternate egress module by storing an indication in said flow block that all sets of information associated with said flow are to be sent to said alternate egress module.

62. (Previously Presented) A router, comprising:

an ingress module;

a first egress module;

an alternate egress module; and

a forwarding mechanism for forwarding information between said ingress module, said first egress module, and said alternate egress module;

wherein said ingress module sends a first set of information to said forwarding mechanism to be forwarded to said first egress module via a first route, said first set of information intended to be forwarded by said first egress module to a destination external to said router, said first set of information traversing a path which encompasses at least a portion of said first route, said forwarding mechanism detecting a failure which precludes forwarding of said first set of information to said first egress module, and in response to said failure, said forwarding mechanism directing a message to said ingress module informing said ingress module of said failure, and based upon said message, said ingress module determining that said first egress module has failed, and in response to said message, said ingress module selecting said alternate egress module and sending a future set of information to said forwarding mechanism to be forwarded to said alternate egress module, said future set of information intended to be forwarded by said alternate egress module to said destination;

wherein said forwarding mechanism directs said message to said ingress module by:

identifying said ingress module;

accessing a routing table which comprises one or more routes to said

ingress module;

obtaining a return route from said routing table, wherein said return route

directs said message to said ingress module along a different path

than that traversed by said first set of information; and

sending said message to said ingress module via said return route; and

wherein said first set of information and said future set of information are both part of a flow, wherein said first egress module and said alternate egress module are predetermined, wherein said ingress module comprises a memory, wherein identifiers associated with said first egress module and said alternate egress module are stored within a flow block associated with said flow, said flow block being stored in said memory, and wherein said ingress module selects said alternate egress module by accessing said flow block to access the identifier associated with said alternate egress module.

63-70 Cancelled

71. (Previously Presented) A router, comprising:

- an ingress module;
- a first egress module;
- an alternate egress module; and
- a forwarding mechanism for forwarding information between said ingress module, said first egress module, and said alternate egress module;

wherein said ingress module sends a first set of information to said forwarding mechanism to be forwarded to said first egress module via a first route, said first set of information intended to be forwarded by said first egress module to a destination external to said router, said first set of information traversing a path which encompasses at least a portion of said first route, said first egress module detecting an external failure which precludes said first egress module from forwarding said first set of information to said destination, and in response to said external failure, said first egress module directing a message to said ingress module informing said ingress module of said external failure,

and in response to said message, said ingress module selecting said alternate egress module and sending a future set of information to said forwarding mechanism to be forwarded to said alternate egress module, said future set of information intended to be forwarded by said alternate egress module to said destination;

wherein said first egress module directs said message to said ingress module by:

identifying said ingress module;

accessing a routing table which comprises one or more routes to said ingress module;

obtaining a return route from said routing table, wherein said return route directs said message to said ingress module along a different path than that traversed by said first set of information; and

sending said message to said ingress module via said return route; and

wherein said first set of information and said future set of information are both part of a flow, wherein said ingress module, in response to said message, prevents other sets of information associated with said flow from being sent from said ingress module to said first egress module, wherein said first egress module and said alternate egress module are predetermined, wherein said ingress module comprises a memory, wherein identifiers associated with said first egress module and said alternate egress module are stored within a flow block associated with said flow, said flow block being stored in said memory, and wherein said ingress module prevents other sets of information associated with said flow from being sent from said ingress module to said first egress module by storing an indication in said flow block that all sets of information associated with said flow are not to be sent to said first egress module.

72. Cancelled
73. (Previously Presented) A router, comprising:
- an ingress module;
 - a first egress module;
 - an alternate egress module; and
- a forwarding mechanism for forwarding information between said ingress module, said first egress module, and said alternate egress module;
- wherein said ingress module sends a first set of information to said forwarding mechanism to be forwarded to said first egress module via a first route, said first set of information intended to be forwarded by said first egress module to a destination external to said router, said first set of information traversing a path which encompasses at least a portion of said first route, said first egress module detecting an external failure which precludes said first egress module from forwarding said first set of information to said destination, and in response to said external failure, said first egress module directing a message to said ingress module informing said ingress module of said external failure, and in response to said message, said ingress module selecting said alternate egress module and sending a future set of information to said forwarding mechanism to be forwarded to said alternate egress module, said future set of information intended to be forwarded by said alternate egress module to said destination;
- wherein said first egress module directs said message to said ingress module by:
- identifying said ingress module;
 - accessing a routing table which comprises one or more routes to said ingress module;

obtaining a return route from said routing table, wherein said return route directs said message to said ingress module along a different path than that traversed by said first set of information; and sending said message to said ingress module via said return route; and wherein said first set of information and said future set of information are both part of a flow, wherein said ingress module, in response to said message, causes other sets of information associated with said flow to be sent from said ingress module to said alternate egress module via said forwarding mechanism, wherein said first egress module and said alternate egress module are predetermined, wherein said ingress module comprises a memory, wherein identifiers associated with said first egress module and said alternate egress module are stored within a flow block associated with said flow, said flow block being stored in said memory, and wherein said ingress module causes other sets of information associated with said flow to be sent from said ingress module to said alternate egress module by storing an indication in said flow block that all sets of information associated with said flow are to be sent to said alternate egress module.

74. (Previously Presented) A router, comprising:

- an ingress module;
- a first egress module;
- an alternate egress module; and
- a forwarding mechanism for forwarding information between said ingress module, said first egress module, and said alternate egress module;

wherein said ingress module sends a first set of information to said forwarding mechanism to be forwarded to said first egress module via a first route, said first set of

information intended to be forwarded by said first egress module to a destination external to said router, said first set of information traversing a path which encompasses at least a portion of said first route, said first egress module detecting an external failure which precludes said first egress module from forwarding said first set of information to said destination, and in response to said external failure, said first egress module directing a message to said ingress module informing said ingress module of said external failure, and in response to said message, said ingress module selecting said alternate egress module and sending a future set of information to said forwarding mechanism to be forwarded to said alternate egress module, said future set of information intended to be forwarded by said alternate egress module to said destination;

wherein said first egress module directs said message to said ingress module by:

identifying said ingress module;

accessing a routing table which comprises one or more routes to said

ingress module;

obtaining a return route from said routing table, wherein said return route

directs said message to said ingress module along a different path

than that traversed by said first set of information; and

sending said message to said ingress module via said return route; and

wherein said first set of information and said future set of information are both part of a flow, wherein said first egress module and said alternate egress module are predetermined, wherein said ingress module comprises a memory, wherein identifiers associated with said first egress module and said alternate egress module are stored within a flow block associated with said flow, said flow block being stored in said

memory, and wherein said ingress module selects said alternate egress module by accessing said flow block to access the identifier associated with said alternate egress module.

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